

**REMARKS**

First, Applicants would like to gratefully acknowledge the courtesies extended by Examiners Christine Foster and Chris Chin in granting a personal interview on October 13, 2006. During that interview, Applicant's representative proposed amending the claims to recite that the solid support is two-dimensional, that the enhancing material is a quaternary onium polymer and that the chemiluminescent substrate is a 1,2-dioxetane substrate. The Declaration under 35 U.S.C. §132, which was filed on June 1, 2006, and the showing of unexpected results contained therein was also discussed. In addition, various amendments were proposed to address the rejections under 35 U.S.C. §112, first and second paragraphs.

Claims 2, 6, 11, 12, 14, 15, 20 and 33 are canceled. Claims 1, 13, 19, 24, 26, 30, 37, 40, 42 and 44 have been amended. Support for the amendments to the claims can be found in the specification at least at page 14, lines 11-12 and page 16, lines 13-15. After entry of the above amendments, Claims 1, 3-5, 7-10, 13, 16-19, 21-32 and 34-45 are pending.

Claims 40 and 42 have been amended to correct the informalities noted in the Official Action (page 5, numbered paragraph 7 of the Official Action). Claims 6 and 33 have been canceled. Reconsideration and withdrawal of the claim objections is therefore respectfully requested.

Claims 24 and 30 were rejected under 35 U.S.C. §112, first paragraph as allegedly failing to comply with the written description requirement. This rejection is respectfully traversed.

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Claims 24 and 30 have been amended to recite that the fluorescent label is attached either directly or indirectly to the probe. Support for this amendment can be found at least at page 7, line 15 *et seq.* of the specification. It is respectfully submitted that this amendment obviates the rejections of these claims. Reconsideration and withdrawal of this rejection is therefore respectfully requested.

Claims 1, 3-10, 13-19 and 21-45 were rejected under 35 U.S.C. §112, second paragraph as allegedly being indefinite. This rejection is respectfully traversed.

Claim 1 has been amended to recite that the probes are *immobilized* on the surface layer of the solid support. The claims have also been amended to address the rejections for alleged lack of antecedent basis. It is respectfully submitted that the amendments obviate the above rejection. Reconsideration and withdrawal of this rejection is therefore respectfully requested.

Claims 1, 3-5, 9, 13-15, 21, 29, 32 and 44 have been rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Cheek, et al. ("Chemiluminescence Detection for Hybridization Assays on the Flow-Thru Chip, a Three-Dimensional Microchannel Biochip," *Anal. Chem.* 73:5777-5783 (2001)) (hereinafter referred to as "Cheek") in view of U.S. Patent No. 6,068,979 to Akhavan-Tafti (hereinafter referred to as "the '979 patent"). This rejection is respectfully traversed.

The above rejection relies upon the disclosure in Cheek of a method of sequentially detecting chemiluminescent emissions on a "microchannel glass" support. Claim 1 as amended is directed to detecting chemiluminescent emissions on a two-dimensional solid support. As shown in Figure 1 of Cheek, the microchannel support

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comprises an ordered array of microchannels that connect the planar surfaces of the support. Accordingly, during an assay “. . . molecular interactions occur within the three-dimensional volume of ordered microchannels rather than at two-dimensional surfaces” (page 5778 of Cheek). Therefore, the assay described in Cheek and relied upon in the Official Action does not occur on a two-dimensional solid support. The ‘979 patent does not remedy the above noted deficiency of Cheek. Moreover, the ‘979 patent is merely being relied upon for the disclosure of surfactant enhancers. Reconsideration and withdrawal of the aforementioned rejection is therefore respectfully requested.

Claims 1, 3-5, 7, 9, 13-15, 21, 25, 27-29, 31-32, 40-41 and 44 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over the ‘979 patent in view of Akhavan-Tafti, “Chemiluminescent Detection of DNA in Low- and Medium-Density Arrays,” *Clinical Chemistry* 44:2065-2066 (1998) (hereinafter “Akhavan-Tafti”).

As acknowledged in the Official Action, the ‘979 patent fails to disclose a plurality of probes disposed on a surface layer at a density of at least 50 or at least 100 discrete areas per  $\text{cm}^2$  (page 16 of the Official Action). In order to remedy this acknowledged deficiency of the ‘979 patent, the Official Action relies upon the Akhavan-Tafti reference which, according to the Official Action, discloses chemiluminescent detection of DNA in low and medium density array of 100 spots per  $\text{cm}^2$  (pg. 19 of the Official Action). The Akhavan-Tafti reference, however, is directed to the use of an acridan substrate (i.e., Lumigen APS-5) whereas Claim 1, as amended, recites the use of 1,2-dioxetane substrates. Accordingly, one of ordinary skill in the art would not arrive at the invention defined by Claim 1 by combining the references in the manner proposed in the Official Action. In addition, there is objective evidence of non-obviousness which

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further distinguishes the subject matter of the claims from the proposed combination of the '979 patent and the Akhavan-Tafti reference. Moreover, a declaration under 35 U.S.C. §132 was previously submitted. As set forth in that declaration, significant improvements in array performance can be realized by using an onium polymer or copolymer chemiluminescent enhancing material and a chemiluminescent 1,2-dioxetane substrate in a microarray format on a two-dimensional support. It is respectfully submitted that this evidence of non-obviousness further distinguishes the subject matter of the claims from the proposed combination of the '979 patent in view of Akhavan-Tafti. In view of the above, reconsideration and withdrawal of this rejection is respectfully requested.

The remaining rejections rely upon the proposed combinations of either: 1) the '979 patent in view of the Cheek reference; or 2) the '979 patent in view of the Akhavan-Tafti reference. As set forth above, neither of the proposed combinations reasonably suggests the claimed invention. Accordingly, reconsideration and withdrawal of these rejections is also respectfully requested.

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**CONCLUSION**

In view of the above amendments and remarks, Applicants respectfully request a Notice of Allowance. If the Examiner believes a telephone conference would advance the prosecution of this application, the Examiner is invited to telephone the undersigned at the below-listed telephone number.

Respectfully submitted,

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January 17, 2007

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